Hypoglycemia in Type 2 Diabetes: A Survey of Physicians from Three Developing Regions

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Abstract

Background Hypoglycemia in type 2 diabetes (T2D) is primarily linked to certain antihyperglycemic therapies. However, limited data exist on physicians' knowledge and clinical practices regarding hypoglycemia, particularly in developing regions.

Objective To assess physicians' knowledge of hypoglycemia and accuracy in treatment decision-making across three developing regions with high diabetes prevalence.

Methods A total of 269 physicians from the Middle East, Africa, and Southeast Asia completed a 6-month online survey (July–December 2021). The questionnaire used multiple-choice and scenario-based questions to evaluate hypoglycemia knowledge, clinical attitudes, and management decisions.

Results Respondents were mostly senior physicians (78.4%), with 42.4% being endocrinologists. Nearly 79.3% correctly recognized that both type 1 diabetes and T2D are susceptible to hypoglycemia, and insulin (95.5%) and sulfonylureas (83.2%) were most commonly identified as high-risk drugs. Only 53.8% could correctly identify severe hypoglycemia. Top concerns included hypoglycemia unawareness (76.0%), renal failure (61.3%), and advanced age (47.9%). Knowledge significantly varied by specialty, with endocrinologists performing better in scenario-based decision-making.

Conclusion Physician knowledge of hypoglycemia remains variable. Improving hypoglycemia-related education and optimizing pharmacologic therapy are essential for reducing the risk and fear of hypoglycemia in patients with T2D.

Keywords
- hypoglycemia
- type 2 diabetes
- physician knowledge
- treatment decision-making
- antihyperglycemic agents
- developing countries

Introduction

Hypoglycemia remains a significant complication in the management of type 2 diabetes mellitus (T2D),[1] particularly with therapies such as insulin and sulfonylureas (SUs).[2,3] Severe episodes can result in seizures, coma, or death, posing substantial clinical and socioeconomic burdens.[4–6] Fortunately, hypoglycemia is increasingly recognized as a preventable adverse drug event, reinforcing the need to understand the role of physician-related factors in its occurrence and management.[7]

Recent updates to the clinical definition and classification of hypoglycemia have been incorporated into professional guidelines.[8] Despite this progress, few studies have explored physicians' knowledge, attitudes, and practices regarding hypoglycemia, especially outside North America.[9] Understanding how physicians in developing regions manage hypoglycemia is particularly important and likely to provide unique data. This is particularly true given the continued reliance of older medications such as older SUs and human insulins and limited access to newer agents with inherently

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المقالة باللغة العربية

انخفاض سكر الدم في داء السكري من النوع الثاني: دراسة استقصائية لأطباء من ثلاث مناطق نامية

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الخلفية: يرتبط انخفاض سكر الدم في داء السكري من النوع الثاني (T2D) أساسا ببعض الأدوية الخافضة للسكر في الدم. ومع ذلك، فإن البيانات المتوفرة بشأن معرفة الأطباء وممارساتهم السريرية تجاه انخفاض سكر الدم، خصوصا في المناطق النامية، لا تزال محدودة.

الهدف: تقييم معرفة الأطباء بانخفاض سكر الدم ودقة قراراتهم العلاجية عبر ثلاث مناطق نامية ذات انتشار عالٍ لمرض السكري.

الطرق: شارك 269 طبيبا من الشرق الأوسط وأفريقيا وجنوب شرق آسيا في استبيان إلكتروني استمر لمدة ستة أشهر (يوليو–ديسمبر 2021). شمل الاستبيان أسئلة متعددة الخيارات وأسئلة قائمة على السيناريوهات لتقييم المعرفة بانخفاض سكر الدم والمواقف السريرية وقرارات العلاج.

النتائج: كان معظم المشاركين من الأطباء ذوي الخبرة (78.4%)، وكان 42.4% منهم من أطباء الغدد الصماء. تعرف 79.3% بشكل صحيح أن كلا من مرضي داء السكري من النوع الأول والثاني معرضون لانخفاض سكر الدم، واعتُبر الإنسولين (95.5%) والسلفونيل يوريا (83.2%) الأكثر ارتباطًا بالمخاطر. ولم يتمكن سوى 53.8% من تحديد نوبة انخفاض سكر الدم الحادة بشكل صحيح. وكان أبرز مصادر القلق هي عدم الإدراك بانخفاض سكر الدم (76.0%)، الفشل الكلوي (61.3%)، وكبر السن (47.9%). وتباينت المعرفة بشكل ملحوظ حسب التخصص، حيث كان أداء أطباء الغدد الصماء أفضل في اتخاذ القرارات العلاجية القائمة على السيناريوهات.

الاستنتاجات: لا تزال معرفة الأطباء بانخفاض سكر الدم غير متجانسة. إن تعزيز التعليم المتعلق بانخفاض سكر الدم وتحسين استخدام العلاج الدوائي أمران ضروريان لتقليل خطر وانعدام الطمأنينة لدى مرضى السكري من النوع الثاني.

الكلمات المفتاحية: انخفاض سكر الدم، السكري من النوع الثاني، معرفة الأطباء، اتخاذ القرارات العلاجية، العلاج الخافض للسكر، الدول النامية.

low hypoglycemic potential, such as incretin-based therapy, sodium glucose cotransporter 2 (SGLT2) inhibitors, and insulin analogs, due to cost limitations.

The present study aimed to (1) assess physicians' knowledge of hypoglycemia, (2) evaluate their clinical decision-making accuracy using case scenarios, and (3) identify predictors of hypoglycemia knowledge and treatment decisions among physicians managing T2D in three developing regions.

Methods

Setting and Design

A cross-sectional survey was conducted over 6 months (July–December 2021) targeting physicians from the Middle East, Africa, and South-East Asia. These regions were selected due to high diabetes prevalence and continued reliance on medications with a higher risk of inducing hypoglycemia.

Participants and Sampling

Without a single endocrine society with a regional membership list that can define a study population, physicians were recruited using convenience sampling via electronic mailing lists similar to previous studies from the region.[10–12] Eligibility criteria included active clinical practice in the target regions, irrespective of specialty or patient load.

Survey Instrument

The survey instrument was adapted from a validated North American study[9] and included multiple-choice, Likert-scale, and scenario-based questions. It covered the following domains: (1) physician demographics and clinical background; (2) hypoglycemia knowledge (definitions, risk factors, treatment); (3) clinical attitudes and risk perception, and practice behaviors and therapeutic decision-making. The questionnaire was administered anonymously through a commercial online platform (Survey Monkey, Palo Alto, California, United States), and informed consent was obtained electronically. The survey was open for 6 months (July–December 2021). The full questionnaire is available in the ►**Supplementary Table S1** (available in the online version).

Data Collection and Analysis

Responses were stored securely and analyzed using descriptive statistics. Percentages were calculated based on the number of respondents per question.

Results

Profiles of Respondents

A total of 269 valid responses were analyzed. The majority practiced in the Arabian Gulf (46.1%), followed by Africa (26.8%) and South-East Asia (16.4%). Country-wise distribution was in decreasing order: United Arab Emirates (81), Saudi Arabia (21), South Africa (20), India (19), Libya (15), Egypt (12), Nigeria (11), Pakistan (11), Oman (10), Tunisia (9), Lebanon (8), Qatar (7), Kuwait (7), Bangladesh (7), Iraq (7), Bahrain (4), Algeria (3), Malaysia (3), Myanmar (2), Syria (2), and a single respondent from Jordan, Kenya, Morocco, Nepal, Palestine, Philippines, Sudan, Uganda, Yemen, and Zimbabwe. Nearly half (49.3%) worked in tertiary university hospitals, with 46.5% practicing in the public sector. Most respondents were senior-level physicians (77.2%) and 35.7% were adult endocrinologists.

Knowledge and Perceptions

Approximately 79.3% of respondents correctly identified both type 1 diabetes and T2D as susceptible to hypoglycemia. Insulin (95.5%) and SUs (83.2%) were widely recognized as high-risk agents (►**Table 1**). However, 10.5% incorrectly associated thiazolidinediones (TZD) with hypoglycemia risk. While 53.9% believed hypoglycemia could cause cardiovascular events, 39.4% acknowledged an unclear relationship, and

Table 1 Perceptions of diabetic hypoglycemia risk by type of diabetes and medications, and its relationship with cardiovascular risk and emergency hospitalization

Question and potential responses:	Number (%)
1. Which type of patient is susceptible to hypoglycemia? [*N* = 266]	
Type 1 diabetes	43 (16.2%)
Type 2 diabetes	12 (4.5%)
Both	211 (79.3%)
2. Which of the following diabetes drugs are more likely to cause hypoglycemia? (select all that apply) [*N* = 268]	
Insulin	256 (95.5%)
Sulfonylureas	223 (83.2%)
Metformin	15 (5.6%)
Dipeptidyl peptidase 4 (DPP-4) inhibitors	10 (3.7%)
Glucagon-like peptide-1 receptor agonists	13 (4.9%)
Thiazolidinediones (TZDs) or glitazones	18 (6.7%)
Sodium-glucose co-transporter-2 (SGLT2) inhibitors	13 (4.9%)
Other (specify)	6 (2.2%)
3. What is the relationship between hypoglycemia and cardiovascular events? (select one) [*N* = 269]	
No relationship	13 (4.8%)
Hypoglycemia causes cardiovascular events	145 (53.9%)
Cardiovascular events cause hypoglycemia	5 (1.9%)
Hypoglycemia and cardiovascular events are correlated, but the nature of the relationship is unclear.	106 (39.4%)
4. From your experience, which results in more hospital admissions, if any, among type 2 diabetes patients? (select one) [*N* = 269]	
Hypoglycemia	67 (24.9%)
Hyperglycemia	127 (47.2%)
Both are equally responsible for hospital admissions	75 (27.9%)

4.8% denied any link. Only 53.8% accurately classified severe hypoglycemia based on clinical scenarios. Recognition was higher for asymptomatic (75.3%) and documented symptomatic hypoglycemia (74.0%) than for pseudo-hypoglycemia (62.6%; ►**Table 2**).

Attitudes and Concerns

Physicians expressed the highest concern for hypoglycemia in patients with hypoglycemia unawareness (75.6%), renal failure (61.0%), and advanced age (41.0%; ►**Table 3**). On average, respondents reported that 14% of their T2D patients had hypoglycemia episodes in the past month, with 77.2% classified as moderate and 23.7% as severe.

Clinical Practices

Common management interventions included patient education (68.3%), increased glucose monitoring (60.3%), and dose reduction of hypoglycemia-inducing agents (58.8%; ►**Table 4**). In the case scenario, 43.0% opted to continue current therapy, while 21.3% preferred discontinuing insulin and up-titrating Janumet (Sitagliptin–Metformin fixed dose combination). Decisions were most influenced by HbA1c target (78.4%), patient weight (60.4%), and desire to simplify treatment (53.6%; ►**Table 5**).

Practices

►**Table 4** summarizes the perceived general recommendations for important interventions for patients with T2D who may have experienced hypoglycemia in the past. The top three choices were patient education on symptoms and signs (68.3%), increasing the frequency of monitoring (60.3%), and lowering the hypoglycemia-inducing medication doses (58.8%).

The responses to the questions related to an illustrative clinical case with good glycemic control on management choices and drivers to therapeutic decisions are summarized in ►**Table 5**. The three top choices were to keep on current treatment (43.0%), followed by discontinuation of insulin and up-titration of Janumet (21.3%), discontinuation with up-titration of Janumet, and also adding an SU, SGLT2i, or a TZD (19.3%). The top three drivers were the HbA1c target (78.4%), weight (60.4%), and reducing the complexity of treatment (53.6%).

Discussion

This study aimed to assess physicians' knowledge and attitudes about hypoglycemia in T2D across three developing regions—an area where such data have been limited.

Table 2 Participants' knowledge of the definition and severity category of various hypoglycemic events[a]

Events [N][b]	Pseudohypoglycemia	Probable symptomatic hypoglycemia	Asymptomatic hypoglycemia	Documented symptomatic hypoglycemia	Severe hypoglycemia	Do not know/not sure
A [*N* = 264]	5 (1.9%)	57 (21.6%)	9 (3.4%)	39 (14.8%)	**142 (53.8%)**	12 (4.5%)
B [*N* = 262]	6 (2.3%)	20 (7.6%)	12 (4.6%)	**194 (74.0%)**	24 (9.2%)	6 (2.3%)
C [*N* = 263]	17 (6.5%)	16 (6.1%)	**198 (75.3%)**	16 (6.1%)	10 (3.8%)	6 (2.3%)
D [*N* = 262]	**164 (62.6%)**	24 (9.2%)	6 (2.3%)	41 (15.6%)	7 (2.7%)	20 (7.6%)
E [*N* = 260]	25 (9.6%)	**174 (66.9%)**	18 (6.9%)	18 (6.9%)	5 (1.9%)	20 (7.7%)

Note: The correct matching is underlined and is in bold.
[a]The question head was phrased: "For the following hypoglycemic events, please indicate the appropriate severity category based on your experience (select one per row).
[b]Descriptions of the events:
A. An event requiring the assistance of another person to actively administer carbohydrates, glucagon, or take other corrective actions. Plasma glucose concentrations may not be available during an event. Still, neurological recovery following the return of plasma glucose to normal is considered sufficient evidence that a low plasma glucose concentration induced the event.
B. An event during which typical symptoms of hypoglycemia are accompanied by a measured plasma glucose concentration ≤70 mg/dL (≤3.9 mmol/L).
C. A measured plasma glucose concentration ≤70 mg/dL (≤3.9 mmol/L) that is not accompanied by typical symptoms of hypoglycemia.
D. An event during which the person with diabetes reports any of the typical symptoms of hypoglycemia with a measured plasma glucose concentration >70 mg/dL (>3.9 mmol/L).
E. An event during which symptoms typical of hypoglycemia are not accompanied by any plasma glucose determination but presumably caused by a plasma glucose concentration ≤70 mg/dL (≤3.9 mmol/L).

Our findings reveal notable variability in knowledge, risk perception, and treatment decision-making, with important implications for both patient safety and physician education.

Consistent with global guidelines, most physicians correctly identified insulin and SUs as primary contributors to hypoglycemia. However, the fact that a significant proportion also associated agents such as TZDs and metformin with hypoglycemia—despite their low intrinsic risk—suggests some misalignment with evidence-based pharmacologic understanding. These misconceptions could influence suboptimal prescribing patterns, such as the unwarranted discontinuation of low-risk agents or inappropriate hesitancy to intensify therapy.

Table 3 The participants' level of concern in terms of associated risk for hypoglycemia with selected clinical, demographic, and biochemical characteristics[a]

Characteristic	Level of concern				
	Not at all	Slightly	Somewhat	Moderate	Extremely
Hypo-unawareness [*N* = 262]	4 (1.5%)	7 (2.7%)	16 (6.1%)	37 (14.1%)	**168 (75.6%)**
Renal failure [*N* = 259]	8 (3.1%)	14 (5.4%)	24 (9.3%)	55 (21.2%)	**158 (61.0%)**
Excessive exercise [*N* = 262]	3 (1.1%)	22 (8.4%)	50 (19.1%)	77 (29.4%)	**110 (42.0%)**
Cardiovascular history [*N* = 262]	5 (1.9%)	31 (11.8%)	46 (17.6%)	70 (26.7%)	**110 (42.0%)**
Advanced age [*N* = 256]	5 (2.0%)	20 (7.8%)	39 (15.2%)	87 (34.0%)	**105 (41.0%)**
Alcohol use [*N* = 261]	14 (5.4%)	25 (9.6%)	44 (16.9%)	77 (29.5%)	**101 (38.7%)**
Pregnancy [*N* = 256]	8 (3.1%)	38 (14.8%)	55 (21.5%)	72 (28.1%)	**83 (32.4%)**
Long diabetes duration [*N* = 259]	10 (3.9%)	30 (11.6%)	68 (26.3%)	**97 (37.5%)**	54 (20.8%)
Low endogenous insulin production [*N* = 260]	49 (18.8%)	42 (16.2%)	58 (22.3%)	**70 (26.9%)**	41 (15.8%)
Weight loss [*N* = 261]	21 (8.0%)	46 (17.6%)	72 (27.6%)	**87 (33.3%)**	35 (13.4%)
Weight gain [*N* = 256]	52 (20.3%)	65 (25.4%)	**66 (25.8%)**	41 (16.0%)	32 (12.5%)
Sedentary life [*N* = 262]	**75 (28.6%)**	64 (24.4%)	54 (20.6%)	38 (14.5%)	31 (11.8%)
HbA1c < 7.0% [*N* = 261]	30 (11.5%)	**77 (29.5%)**	73 (28.0%)	52 (19.9%)	29 (11.1%)
Others [*N* = 125]	**39 (31.5%)**	19 (15.3%)	28 (22.6%)	22 (17.7%)	16 (12.9%)

Note: Bold responses are the most frequent responses.
[a]The question head was phrased: "For each of the following characteristics, please rate your concern regarding its associated risk for hypoglycemia (select one per row).

Table 4 The perceived general recommendations for important interventions for your patients with T2D who may have experienced hypoglycemia in the past (affirmative responses are reordered in decreasing order; responses are not mutually exclusive)[a]

Interventions	Responses: [*N* (%)]
Educate the patient on the warning signs of hypoglycemia	179 (68.3%)
Increase the frequency of blood glucose monitoring	158 (60.3%)
Lower the dose of any hypoglycemia-inducing medication	154 (58.8%)
Switch the patient to a non-hypoglycemia-inducing medication	143 (54.6%)
Advise patient to check blood sugar during the overnight	133 (50.8%)
Advise patient to check blood sugar before driving	128 (48.9%)
Recommending getting a "Medi-Alert" type of bracelet or necklace	122 (46.6%)
Provide the patient with a prescription and instructions for glucagon emergency injections	117 (44.7%)
Other	15 (5.7%)
All of the above	**147 (56.1%)**

Abbreviation: T2D, type 2 diabetes.
[a]The question head was phrased: Which of the following do you generally recommend as important interventions for your patients with type 2 diabetes who may have experienced hypoglycemia previously (select all that apply)? Total responses: 262.

Table 5 Illustrative single clinical case scenario with questions on management choices and drivers to therapeutic decisions

A. Clinical case history, examination, and laboratory findings A 45-year-old male with a BMI of 28.0 kg/m^2. The patient was diagnosed with type 2 diabetes 2 years ago. He reports steady weight over the past 12 months. Blood pressure: 135/80 mm Hg. His current Labs: lipid profile (total cholesterol): 200 mg/dL; HbA1c: 6.5%; serum creatinine: 0.8 mg/dL. The patient has taken Sitagliptin–Metformin (Janumet) 50 mg/1,000 mg and insulin NPH (Insulatard) 20 units/day for 1 year. He has never experienced hypoglycemia. Other comorbidities/complications include atherosclerosis with no treatment. Lifestyle and activity level notes: the patient's insurance coverage is private. Diet: eats 3 meals on time and in full, regularly prepares home-cooked meals. Activity levels: active, exercises two to three times a week.	
B. Therapeutic decisions: Question: Given the above description of a hypothetical patient with T2D, what would be your recommendation for a treatment decision, if any, for this patient? Please assume this is a new patient coming to your office for the first time. [Select one answer only]	
Choices [*N* = 249]	**Responses (*N* (%))**
Keep on current treatment.	107 (43.0%)
Discontinue insulin, up-titrate Janumet.	53 (21.3%)
Discontinue insulin, up-titrate Janumet, and add an SU, SGLT2i, or a TZD.	48 (19.3%)
Discontinue metformin; continue Janumet.	8 (3.2%)
Add prandial insulin.	2 (0.8%)
None of the above.	31 (12.4%)
C. Drivers of the therapeutic decisions: In choosing the best answer to the above question, the following factors from this patient's description were most important in my treatment decision. [Select all that apply]	
Choices [*N* = 250]	**Responses (*N* (%))**
HbA1c target	196 (78.4%)
Weight	151 (60.4%)
Reducing the complexity of treatment	134 (53.6%)
Renal function	103 (41.2%)
Patient's age	92 (36.8%)
Cost of medicine	83 (33.2%)

Abbreviations: BMI, body mass index; Janumet, Metformin–Sitagliptin fixed dose combination; SGLT2i, sodium glucose cotransporter 2 inhibitor; SU, sulfonylurea; T2D, type 2 diabetes; TZD, thiazolidinedione.

Of greater concern is the low rate of correct identification of severe hypoglycemia, a clinically critical condition.[7,8] Only 52.5% of physicians could accurately classify it, even though its definition is well standardized in current guidelines. This gap is particularly problematic because delayed or inappropriate responses to severe hypoglycemia can have life-threatening consequences, including neurological damage and cardiovascular complications.

Physicians generally demonstrated higher recognition of mild-to-moderate hypoglycemia symptoms, and attitudes toward risk factors—such as renal impairment and advanced age—were largely appropriate.[7] The elevated concern for hypoglycemia unawareness also reflects a good understanding of risk-enhancing factors. However, the overall knowledge appeared more pattern-based than guideline-driven, underscoring the need for structured training grounded in widely accepted definitions and protocols.[8]

Notably, physician specialty played a critical role in knowledge levels. Endocrinologists were more likely than primary care providers (PCPs) to provide correct answers and demonstrate evidence-aligned decision-making.[13] This trend aligns with prior studies in endocrinology and diabetes care, which show that subspecialty training correlates with greater adherence to standards and improved patient outcomes. However, PCPs manage the bulk of diabetes cases in many developing countries. Thus, bridging this knowledge gap is not just desirable but essential for health system performance.[14]

An unexpected yet insightful finding was that physicians seeing fewer T2D patients per month had better knowledge scores. This may suggest that clinicians with lower patient volumes may have more time for continuing education or patient-level decision-making, while high-volume practice environments could limit opportunities for detailed assessment and reflection. This finding underscores the importance of maintaining standard numbers of patients in clinics to achieve a balance between adequate exposure and overwhelmingly busy schedules.[15]

The case scenario revealed a degree of therapeutic inertia, with less than half of respondents choosing to maintain the current regimen in a patient with well-controlled diabetes and no history of hypoglycemia.[16,17] While this decision may be clinically acceptable, the proportion who recommended simplifying therapy (e.g., discontinuing insulin in favor of oral agents) was relatively modest, despite evidence supporting de-intensification in such cases.[18] This may reflect discomfort with de-prescribing or uncertainty about the safety of treatment simplification—another area for targeted education.[14] System-based limitations such as drug availability, lack of de-escalation protocols, and busy practices could have contributed to these choices.

Our findings are consistent with the North American study, which also reported variability in hypoglycemia understanding among providers.[9] However, the regional context of our research—covering countries with resource limitations and higher use of older antihyperglycemic agents—introduces additional risks not present in better resourced systems. Previous Middle East and Africa-focused surveys have highlighted similar challenges in thyroid and adrenal disorders, reinforcing a pattern of under-addressed endocrinology education across the region.[10–12]

In terms of broader implications, our study suggests a few key actions. Tailored educational interventions for generalists and early-career physicians should emphasize hypoglycemia recognition, severity categorization, and pharmacologic risks. Clear dissemination of international definitions and classification systems can help harmonize practice. Clinical decision support: simple tools (e.g., hypoglycemia risk calculators and triggers for increased risk of hypoglycemia in the appropriate populations) embedded into electronic health records could prompt appropriate adjustments at the point of care. Ministries of health in low-resource settings could mandate short courses or continuous medical education (CME) modules specifically on safe prescribing and hypoglycemia prevention precautions in older adults, those with cognitive impairment, and people with impaired kidney function.

While the study provides novel insights, several limitations warrant acknowledgment. First, the convenience sampling strategy introduces potential selection bias. Those with more interest or expertise in diabetes care may have been more likely to participate, possibly overestimating knowledge levels. Another impact of convenience sampling is the predominance of the Arabian Gulf representation observed in other surveys which were imposed by the nature of the participants' database.[10–12] Future studies should impose quotas on participants from different regions. Second, all responses were self-reported and not verified against actual patients' data or clinical practice outcomes. This could result in social desirability bias or inaccuracies in self-assessed competence; a recognized pitfall in all survey-based studies.[19] Third, while we used a single case scenario to explore treatment decision-making, real-world decisions are influenced by broader system-level factors, including drug availability, health care infrastructure, and patient preferences, which were not captured in this study. Use of more cases could have allowed a much more in-depth analysis. Finally, although the survey was adapted in the same language from a validated tool, cross-cultural validation for use in our regions was not independently performed. Pitfalls in this context have been extensively studied in various settings worldwide.[20] Future work should assess psychometric properties and possibly integrate qualitative methods for richer insight.

Conclusion

Hypoglycemia remains a significant barrier to optimal T2D care in developing regions, especially where insulin and SUs remain common due to cost and access limitations. This study demonstrates that physician knowledge—particularly in identifying severe hypoglycemia and making individualized treatment decisions—varies substantially, and this variability can directly impact patient outcomes.

Improving hypoglycemia management in clinical practice requires a multifaceted approach: reinforcing accurate pharmacologic knowledge, enhancing awareness of

hypoglycemia types and severity, and supporting physicians in treatment optimization and deintensification where appropriate. Interventions should be targeted not only at endocrinologists but also at primary care physicians who manage the majority of diabetes cases in these regions.

By identifying key gaps in knowledge and behavior, this study highlights critical opportunities for physician training, policy support, and research aimed at minimizing hypoglycemia risks and improving the quality of diabetes care in resource-constrained settings.

Conflict of Interest
None declared.

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